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TAGS: TGEN, JA
SUBJECT: SCIENCE AND TECHNOLOGY WHITE PAPER FOR JFY 1976

1. WHITE PAPER ON SCIENCE AND TECHNOLOGY FOR JFY 1976,
APPROVED BY CABINET DECEMBER 20, 1977, NOTED THAT JAPANESE
SCIENCE AND TECHNOLOGY ARE AT CROSSROADS NOW THAT THE
DRIVING FORCE FOR THEIR DEVELOPMENT (CONSISTING OF
(A) INDUCTION OF FOREIGN TECHNOLOGY AND (B) INVESTMENT IN
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RESEARCH AND DEVELOPMENT BY PRIVATE INDUSTRY) HAS SLOWED
DOWN. THE WHITE PAPER SUGGESTED THAT THE ONLY WAY OUT
OF THE DOLDRUMS WAS TO STEP UP INTERNAL TECHNOLOGY
TRANSFER AS A MEANS
OF MAKING EFFICIENT USE OF TECHNOLOGY
WHICH HAS BEEN ACCUMULATED THROUGH ACTIVE INTRODUCTION OF
FOREIGN TECHNOLOGY AND ENERGETIC RESEARCH AND
DEVELOPMENT ACTIVITIES IN THE 1960'S. INTERNAL
EXCHANGE AND USE OF DOMESTIC TECHNOLOGY WOULD BE
DESIGNED TO PROMOTE ECONOMICALLY EFFICIENT TECHNOLOGY

DEVELOPMENT UNDER SLOWED ECONOMIC GROWTH.

2. WHITE PAPER EXAMINES WAYS TO RAISE THE NATION'S TECHNOLOGICAL LEVEL AND ITS TECHNOLOGICAL DEVELOPMENT CAPACITY. ON BASIS OF TECHNOLOGICAL LEVEL AND DEVELOPMENT CAPACITY OF 100 ON HEDONIC SCALE FOR U.S., JAPAN STOOD AT 41 AND 30, RESPECTIVELY, RANKING NEXT TO WEST GERMANY (40.4 AND 35.6).

3. POINTING TO A SLOWDOWN IN INTRODUCTION OF FOREIGN TECHNOLOGY BY PRIVATE CORPORATIONS DUE TO BUSINESS RECESSION, EPORT STATED THAT JAPAN SHOULD PROMOTE ITS OWN TECHNOLOGICAL DEVELOPMENT WITHOUT RELYING ON FOREIGN TECHNOLOGY. RECENT IMPORTS OF FOREIGN TECHNOLOGY HAVE BEEN STAGNANT, WITH 1,461 CASES RECORDED BY FY 1976 COMPARED TO A PEAK OF 1,931 IN FY 1973, ACCORDING TO THE REPORT.

4. WHITE PAPER ALSO STRESSED THAT JAPAN SHOULD INCREASE ITS EXPENDITURE ON NATURAL SCIENCE RESEARCH, WHICH ACCOUNTED FOR ONLY 2.06 AND 2.03 PER CENT OF NATIONAL INCOME IN FY 1975 AND 1976, RESPECTIVELY.

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5. GIST OF WHITE PAPER FOR FY 1976 IS AS FOLLOWS:

PRESENT STATE OF SCIENCE AND TECHNOLOGY

A. IN OVERCOMING VARIOUS DIFFICULTIES FACED BY JAPAN AND IN WORKING FOR STABLE DEVELOPMENT OF ECONOMY AND IMPROVEMENT OF LIVING STANDARD FOR LONG PERIOD OF TIME TO COME, EXPECTATIONS PLACED ON PROGRESS OF SCIENCE AND TECHNOLOGY ARE GREATER THAN EVER BEFORE. IN THIS SITUATION, ROLES IMPOSED ON TODAY'S SCIENCE AND TECHNOLOGY INCLUDE, (1) OVERCOMING OF RESOURCES CONSTRAINTS--DEVELOPMENT OF ALTERNATIVE ENERGY SUPPLIES SUBSTITUTING FOR OIL, (2) QUALITATIVE IMPROVEMENT OF NATIONAL LIFE--PRESERVATION OF THE ENVIRONMENT, PREVENTION OF DISASTERS, PROMOTION OF HEALTH, ETC., AND (3) INTERNATIONAL COOPERATION AND SECURING OF INTERNATIONAL COMPETITIVE POWER THROUGH INDEPENDENT DEVELOPMENT OF TECHNOLOGY.

B. WHEN TECHNOLOGICAL LEVEL AND TECHNOLOGICAL DEVELOPMENT CAPACITY LEVEL ARE COMPARED WITH THOSE OF U.S., BRITAIN, FRANCE AND WEST GERMANY, JAPAN RANKED LOWEST IN LATTER HALF OF THE 1960'S BUT IT RANKED THIRD IN FIRST HALF OF THE 1970'S, FOLLOWING THE U.S. AND WEST GERMANY. HOWEVER, DIFFERENCE FROM U.S. IS STILL GREAT IN BASIC AND PIONEERING FIELDS OF SCIENCE SUCH AS

AIRCRAFT AND NUCLEAR ENERGY.

C. PRIVATE INDUSTRY IN JAPAN IS LAGGING BEHIND
INDUSTRY OF WESTERN COUNTRIES IN TECHNOLOGY DEVELOPMENT
CAPACILITIES. THIS IS DUE TO INADEQUATE INVESTMENT
IN RESEARCH AND SHORTAGE OF TALENTED PEOPLE WITH
ORIGINALITY AND ALSO DUE TO THE FACT THAT JAPANESE
EFFORTS HAVE THUS FAR BEEN DIRECTED MORE TO FILL THE
TECHNOLOGICAL GAP WITH IMPORTED TECHNOLOGY AND LESS TO
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FORSTER ORIGINAL RESEARCH AND DEVELOPMENT.

STAGNATION OF SCIENCE AND TECHNOLOGY ACTIVITIES

A. INDUCTION OF FOREIGN TECHNOLOGY HAS TENDED TO
BE STAGNANT OVER PAST SEVERAL YEARS. FOR EXAMPLE, RATIO
OF PAYMENTS FOR IMPORTED TECHNOLOGY TO GNP WAS AT THE
0.2 PERCENT LEVEL UNTIL FIRST HALF OF THE 1965-1974
PERIOD, BUT IT BEGAN TO FALL IN FISCAL 1971, DROPPING FROM
0.21 PER CENT TO 0.15 PER CENT DURING THE FIVE YEAR
PERIOD ENDING WITH FY 1976.

B. INVESTMENT IN RESEARCH SHARPLY INCREASED IN FY
1975--6.2 TIMES THAT FOR FISCAL 1965 IN NOMINAL TERMS. IN
REAL TERMS, HOWEVER, IT INCREASED BY ONLY TWICE FROM FY
1965 TO FY 1970, AND IN FY 1975 IT INCREASED ONLY 14 PER CENT
OVER FY 1970. THUS, ACTUAL INCREASE IN RESEARCH SPENDING
IN LATTER HALF OF THE 1965-74 PERIOD WAS SMALL. THIS IS
CONSIDERED DUE TO SHARP RISE IN PERSONNEL EXPENSES AND
PRICES OF RESEARCH MATERIALS. HOWEVER, A MAJOR REASON IS
THAT RESEARCH SPENDING BY PRIVATE INDUSTRY, WHICH ACCOUNT
FOR 65 PER CENT OF RESEARCH INVESTMENT IN JAPAN, HAS SLOWED
DOWN. THERE IS CONCERN THAT THIS WILL REDUCE THE
POTENTIAL FOR TECHNOLOGICAL DEVELOPMENT IN INDUSTRIAL
SECTOR AND BRING ABOUT GENERAL LAG IN TECHNOLOGICAL
DEVELOPMENT IN JAPAN.

TASKS FOR PROMOTION OF TECHNOLOGY DEVELOPMENT

A. TO PROMOTE THE DEVELOPMENT OF TECHNOLOGY, IT IS
NECESSARY TO FOSTER TECHNOLOGICAL TALENT, WORK FOR OPTIMUM
DISTRIBUTION AND EFFICIENT USE OF RESEARCH FUNDS AND
MANPOWER, AND CONSOLIDATE SYSTEM FOR DISSEMINATION OF
SCIENTIFIC AND TECHNOLOGICAL INFORMATION. HOWEVER, IN
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ADDITION TO THESE, IT IS ALSO IMPORTANT TO PROMOTE
INTERNAL TRANSFER OF TECHNOLOGY FOR EFFECTIVE USE OF
TECHNOLOGY ACCUMULATED IN JAPAN AS A MEASURE WHICH WILL
HAVE IMMEDIATE EFFECT.

B. INTERNAL TECHNOLOGY TRANSFER CAN HAVE THE FOLLOWING BENEFITS:

(1) IT WILL HELP TO AVOID OVERLAPPING OF RESEARCH INVESTMENT; (2) IT SHOULD INCREASE THE EFFICIENCY OF RESEARCH AND DEVELOPMENT LEADING TO GREATER SOPHISTICATION OF SCIENCE AND TECHNOLOGY; (3) IT SHOULD IMPROVE TECHNOLOGICAL DEVELOPMENT CAPACITY OF SMALL AND MEDIUM SIZE INDUSTRIES; AND (4) IT MAY BE EFFECTIVE IN DEVELOPING TECHNOLOGY NEEDED TO IMPROVE THE LIVING ENVIRONMENT.

C. THERE IS ALREADY SOME MOVEMENT TOWARD PROMOTING TECHNOLOGY TRANSFER, BUT THE EXTENT IS STILL FAR FROM SATISFACTORY. ACTUALLY, THERE ARE A NUMBER OF FACTORS HINDERING TECHNOLOGY TRANSFER. GREATER EFFORTS MUST BE MADE TO UTILIZE THE ACCUMULATED TECHNOLOGY HERE, WITH ATTENTION PAID TO THE FOLLOWING:

(1) PERSONS FURNISHING AND RECEIVING TECHNOLOGY MUST RECOGNIZE IMPORTANCE OF TECHNOLOGY TRANSFER AND CONSOLIDATE SYSTEM FOR ITS PROMOTION; (2) FUNCTIONAL IMPROVEMENT OF DISSEMINATION OF TECHNOLOGY INFORMATION IS NEEDED; (3) EVALUATION OF TECHNOLOGY TO BE TRANSFERRED SHOULD BE FACILITATED; AND (4) PROMOTION OF COOPERATIVE RESEARCH SHOULD BE EXPANDED.

TRENDS IN RESEARCH ACTIVITIES

R&D EXPENDITURE (IN THE NATURAL SCIENCE SECTOR) TOTALED YEN 2,621,800 MILLION IN JFY 1975, UP 8.3 PER CENT OVER PRECEDING FISCAL YEAR. THIS WAS LOWEST RATE OF INCREASE SINCE 1955. ITS RATIO OF NATIONAL INCOME WAS UNCLASSIFIED

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2.06 PER CENT, AGAIN SHOWING DOWNWARD CURVE. TO ATTAIN THE 2.5 PER CENT TARGET ANNOUNCED BY THE COUNCIL FOR SCIENCE AND TECHNOLOGY IN MAY 1977 REQUIRES CONCERTED EFFORTS BY THE GOVERNMENT AND PRIVATE SECTOR. OF TOTAL AMOUNT OF RESEARCH SPENDING, PORTION BORNE BY THE GOVERNMENT, EXCLUDING DEFENSE RESEARCH EXPENDITURE, WAS 27.0 PER CENT--MUCH LOWER THAN 49.9 PER CENT IN FRANCE, 49.1 PER CENT IN WEST GERMANY, AND 35.9 PER CENT IN U.S.

TRENDS IN SCIENTIFIC AND TECHNOLOGICAL INFORMATION ACTIVITIES

RAPID PROGRESS IN SCIENCE AND TECHNOLOGY HAS RESULTED IN SHARP INCREASE IN VOLUME OF SCIENTIFIC AND TECHNOLOGICAL INFORMATION. SMOOTH AND EFFICIENT DISSEMINATION OF VOLUMINOUS AND DIVERSE SCIENTIFIC AND TECHNOLOGICAL INFORMATION IS ESSENTIAL TO MEET

ADEQUATELY THE INCREASING DEMAND FOR INFORMATION, PARTICULARLY IN AREAS RELATED TO SOCIAL DEVELOPMENT SUCH AS ENVIRONMENTAL POLLUTION, RESOURCES AND ENERGY. CURRENT EFFORTS BEING MADE IN SCIENTIFIC AND TECHNOLOGICAL INFORMATION ACTIVITIES ARE DIRECTED TOWARD RAISING THE LEVEL AND INCREASING THE EFFICIENCY OF TECHNIQUES FOR UTILIZING INFORMATION TO MEET THE DEMAND FOR ONLINE INFORMATION SEARCH SYSTEMS AND TOWARD FURTHER STEPPING UP INFORMATION ACTIVITIES BY PUBLIC INFORMATION DISSEMINATION ORGANIZATIONS SUCH AS SPECIALIZED CENTERS. TRENDS OF TECHNOLOGY TRADE AND PATENT APPLICATION

TECHNOLOGY EXPORTS AMOUNTED TO DOLS 173 MILLION IN JFY 1976, REPRESENTING AN INCREASE OF 7.4 PER CENT OVER PRECEDING FISCAL YEAR, WHILE IMPORTS AMOUNTED UNCLASSIFIED

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TO DOLS 846 MILLION, UP 18.8 PER CENT OVER PRCEDING FISCAL YEAR. AS RESULT, RATIO OF TECHNOLOGY EXPORTS TO IMPORTS STOOD AT 20.4 PER CENT, DOWN 2.2 POINTS FROM THE PRECEDING YEAR. NUMBER OF APPLICATIONS FOR PATENTS HAS BEEN ON INCREASE IN RECENT YEARS. IN 196, THEY NUMBERED 161,016, AN INCREASE OF 0.7 PER CENT OVER THE PRECEDING YEAR.

TRENDS IN INTERNATIONAL EXCHANGES

INTERNATIONAL COOPERATIVE ACTIVITIES IN SCIENCE AND TECHNOLGOY HAVE BECOME INCREASINGLY BRISK, AGAINST THE BACKGROUND OF ENVIRONMENTAL POLLUTION, FOOD SHORTAGES, AND RESOURCES AND ENERGY SCARCITIES.H THERE HAS BEEN EXPANSION OF JAPAN'S SCIENTIFIC AND TECHNOLOGICAL COOPERATION WITH OTHER COUNTRIES IN RECENT YEARS. IN ADDTION TO U.S., WEST GERMANY, FRANCE, CANADA, AUSTRALIA AND THE SOVIET UNION HAVE BECOME JAPAN'S PARTNERS WITH CONCLUSION OF SCIENTIFIC AND TECHNICAL COOPERATION AGREEMENTS AND REGULAR BILATERAL CONFERENCES.

GOJ SCIENCE AND TECHNOLOGY BUDGET

GOJ SCIENCE AND TECHNOLOGY BUDGET HAS BEEN INCREASING AT A RATE AVERAGING MORE MORE THAN 20 PER CENT ANNUALLY. IN JFY 1976, THE BUDGET AMOUNTED TO YEN 785 BILLION, AN INCREASE OF 14.4 PER CENT OVER PRECEDING FISCAL YEAR. ITS RATIO TO GENERAL ACCOUNT BUDGET WAS 3.23 PER CENT. OF THIS AMOUNT, YEN 180 BILLION (23 PER CENT) WAS EARMARKED FOR NUCLEAR ENERGY AND SPACE ACTIVITIES. COMPARED WITH JAPAN, U.S. AND USSR ARE ALLOCATING FAR MORE PUBLIC MONEY TO SCIENCE AND TECHNOLOGY; U.S. BY A FACTOR OF 8 AND USSR BY A FACTOR OF 5.6.

RESEARCH ACTIVITIES AT GOVERNMENT LABS

MAJOR RESEARCH AREAS BEING ADDRESSED BY PUBLIC

RESEARCH LABORATORIES INCLUDE (1) ENERGY, FOOD, MINERAL
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RESOURCES, WATER RESOURCES; (2) ENVIRONMENTAL PROTECTION,
DISASTER PREVENTION, FOOD AND DRUGS, TRANSPORTATION;
(3) HEALTH, AGAIN, REHABILITATION, MEDICINE; (4) SPACE
\$3;3)90.3,5, MARINE SCIENCE, LIFE SCIENCE, SOFT
TECHNOLOGY.

AID TO PRIVATE SECTOR

IN JFY 1976, GOVERNMENT SUBSIDIES AND GRANTS TO PRIVATE
SECTOR AMOUNTED TO YEN 327.7 BILLION, AN INCREASE OF
16.7 PER CENT OVER PRECEDING YEAR. THE AMOUNT WAS NEARLY
10 TIMES AS LARGE AS THAT IN FY 1969.

STRENGTHENING BASIS FOR PROMOTION OF SCIENCE

GOVERNMENT MEASURES INTENDED TO CONTRIBUTE TO SMOOTH
AND EFFICIENT RESEARCH ACTIVITIES CENTERED ON BUILDING
UP RESEARCH ORGANIZATION, TRAINING OF RESEARCH
MANPOWER, IMPROVING SALARY SCALE FOR RESEARCHERS,
CONSTRUCTION OF TSUKUBA RESEARCH CENTER, IMPROVING
PATENT SYSTEM, SCIENCE EDUCATION ACTIVITIES, AND
INDUSTRIAL STANDARDIZATION.

6. STA IS NOW PREPARING ENGLISH-LANGUAGE SUMMARY OF
REPORT. EMBASSY WILL TRANSMIT COPIES OF REPORT WHEN
READY.

7. COMMENT: INTERNAL TECHNOLOGY TRANSFER PROPOSED
BY AUTHORS OF WHITE PAPER AS A MEANS OF MAKING EFFICIENT
USE OF TECHNOLOGY AND RAISING THE TECHNOLOGICAL LEVEL
OF THE COUNTRY AS A WHOLE IS EASIER SAID THAN DONE.
MOREOVER, ITS APPARENT MERITS--NOTABLY AVOIDANCE OF
DUPLICATION OF RGD EFFORTS AND RESOURCES--MAY EVEN BE
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OUTWEIGHED BY ITS POTENTIAL DEMERITS: ENCOURAGEMENT
OF TECHNOLOGY TRANSFER MAY REDUCE COMPETITION AMONG
RESEARCH LABS, ESPECIALLY IN PRIVATE INDUSTRY, AND MAY
EVEN GENERATE UNDESIRABLE TENDENCY TOWARD
CARTELIZATION.
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